King County
Geographic Information System

2007
Training Curriculum

King County

KCGIS Training Curriculum

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Introduction

Vision and Goal
The vision of the King County GIS (KCGIS) training program is to provide a framework for ongoing and relevant GIS education, which will empower current and potential GIS community members as proactive spatial thinkers who can visualize their data, support better decision-making, and deliver superior public service using GIS tools.

This vision is put into action by developing training opportunities that are modular, customized, and geared toward defined categories of users within the GIS community. The resulting training curriculum is designed to be specific and detailed, yet broad enough to suit the business needs of individuals from many disciplines. A range of educational offerings allows users to stick to GIS basics, or to expand their knowledge with advanced or highly specialized topics.

User Focused GIS Education
A key tenet of the KCGIS training program is to provide education opportunities that meet the needs of a wide variety of GIS users. The decision on how to use the program is up to individuals and their supervisors, based on business needs of the agency and career goals of the individual. The curriculum plans presented in this document are not meant to be rigid, but rather offer recommended guidelines for GIS education. Some courses are highly recommended while others are listed as optional.

The GIS curriculum consists of KCGIS custom courses, some accredited to earn points toward GISP certification, courses offered by ESRI, documents prepared by KCGIS describing GIS standards and best practices, and periodic meetings of KCGIS user groups. The training courses are listed and described in this document, and the KCGIS standards documents and the calendar of user group meetings are available on the KCGIS Center website (www.metrokc.gov/gis).

The KCGIS Training Coordinator is a resource for GIS education and is available to consult with individuals and groups to determine the best approach for improving GIS skills and performance. The Training Coordinator can be contacted at 206-263-5220.

GIS User Categories
Six categories of GIS users are identified for the purpose of organizing the GIS training curriculum. Four are technical user categories that require varying levels of GIS skill and knowledge. The other two categories are for individuals who do not personally use GIS, but deal with GIS issues as decision-makers or as technical support staff. Many King County staff members were assigned to a GIS user category as a result of a survey conducted in 2004 (see the assignment list on the KCGIS intranet at gisdw/intranet/SoftMigr/documents/CategorizedUsers.xls). Individuals can use these assignments to follow the recommended training curriculum, or GIS users and their supervisors can self-assign categories based on the following category descriptions.

Data User: These are GIS end-users, who are concerned with querying and viewing GIS data, and perhaps with creating hardcopy output of GIS maps and associated information. Data Users do not create or modify data. While they may use GIS routinely in their day-to-day work, their primary job description is not GIS-oriented.

Data Analyst: Data Analysts can be either GIS professionals or end-users. Like Data Users, they also query and view GIS data, and likely create hardcopy output using GIS. However, they tend to employ more sophisticated GIS methods, and create more complex and technically demanding maps than Data Users. They likely create and maintain GIS data for project-level use, but generally do not create and maintain data that is used beyond the scope of their immediate work group. Data Analysts may also provide support to other GIS users.

Data Maintainer (Steward): Data Maintainers are GIS professionals who are usually also Data Analysts, but are also stewards of enterprise data (that is data used by multiple groups or agencies). They deal with

data related issues of conversion, quality assurance and control, and metadata. Data Maintainers likely provide support to other GIS users.

Developer: These are GIS professionals who are responsible for the development of GIS scripts, programs, and applications that are typically used by others. They deal with software development issues such as requirements definition, design, testing, deployment, troubleshooting, and operation. Developers nearly always provide support to other GIS users.

Decision-maker: While Decision-makers may properly be assigned to any of the other user categories, this category includes those individuals who have little or no experience with GIS, but must still deal with GIS issues. Decision-makers may be supervisors or managers who have GIS personnel working for them, or they may be project managers whose projects have a GIS component.

Database/System Administrator: Database/System Administrators, and other IT support personnel may or may not be familiar with GIS concepts and software functionality, yet have a need to deal with GIS from a technical standpoint (such as maintenance of a RDBMS containing a geodatabase, or administration of desktop computers loaded with GIS software) as part of the IT support services they provide.

Curriculum Overview and Status

The KCGIS training curriculum concept was developed in 2004 by the GIS Training Workgroup, and approved by the KCGIS Technical Committee in early 2005. Since that time the GIS Training Workgroup has been engaged in developing courses and revising and updating the curriculum plan.

The key component of the training curriculum is the custom courses developed by experienced King County personnel. While ESRI, the developer of the GIS software used by King County, offers an array of GIS training courses, both online and instructor-led, its offerings tend toward a one-size-fits-most philosophy. Some ERSI courses are too technical or too long for the casual GIS user, and some are not comprehensive or specific enough to meet the needs of King County's professional GIS staff. The relatively high cost of ESRI training is also prohibitive. The KCGIS custom courses are designed to replace and/or supplement the ESRI training and are considered integral to maintaining a high-performance GIS workforce for King County.

Six different KCGIS custom courses were taught in 2006. While the course feedback was uniformly positive from attendees, and a few sessions were filled to capacity, other sessions were canceled due to low enrollment. The following table provides a summary.

Designation and Custom Course Title	Number of Sessions	Number of Students
B-2 – Exploring King County Data Using Metadata	1	4
EA-2 – KCGIS Metadata: Creation, Posting, Maintenance and Best Practices	2	10
EA-3 – Posting Data to the King County Spatial Data Warehouse	2	14
EA-8 – Basics of SQL	2	16
EA-9 – Geoprocessing for Analysts	1	17
XT-6 – Keeping Up With ESRI	1	7
Totals for 2006	**9**	**68**

Note: Two sessions of B-2, and one session each of EA-9 and XT-6 were canceled due to low enrollment.

With the low enrollment issue as a driving factor, the GIS Training Workgroup decided to reconsider the scope of the training curriculum. As a result, several yet to be developed custom courses included in the 2006 plan are dropped from the 2007 curriculum. Courses were generally eliminated if they failed to pass one or more of three tests. One, if it was deemed that the target audience of potential students was too small to make development of the course worthwhile. Two, if the course content could reasonably be combined into another course. Or three, if the course was considered too peripheral to the core goal of

educating and empowering current and potential KCGIS community members. The disposition of all custom courses included in the 2006 curriculum plan is described in Appendix A.

The KCGIS training curriculum is a work in progress. Development of four new courses was completed in 2006. Six other courses are currently in various stages of development. It is anticipated that as more courses are completed further changes to the curriculum will be made. Once completed each course needs to be periodically reviewed to ensure it remains timely and does not contain obsolete information. By the end of 2007 it is anticipated that nearly all the custom courses will be completed, and the ongoing operation and maintenance of the training curriculum will be in full swing.

The work of the GIS Training Workgroup and the development and maintenance of class material is funded as a KCGIS O&M priority initiative. Teaching of classes is funded via the KCGIS Center Client Services Group with cost recovery via registration fees.

The training curriculum described in this document represents current thinking and planning for GIS education in King County. This document is the 2007 annual update of the training curriculum, as recommended by the GIS Training Workgroup and approved by the KCGIS Technical Committee. The most recent version of the curriculum can be found on the KCGIS Center website at www.metrokc.gov/gis/kb/Content/TrainingPlan.htm. The workgroup welcomes feedback on the curriculum, which can be directed to the KCGIS Training Coordinator.

Training Curriculum Marketing Plan

The goal of the KCGIS training marketing plan is to ensure that potential markets are identified and informed of GIS training offerings to result in sufficient class attendance to support the cost of class offerings. Secondary objectives include identifying GIS-related training needs that are not yet being met and informing potential and actual students of other KCGIS services and resources.

Marketing Material: The KCGIS Center website is the primary marketing medium. It is designed to be a comprehensive source for information about the KCGIS training program. For general training information see www.metrokc.gov/gis/Training/index.htm, for the catalog of KCGIS taught classes see www.metrokc.gov/gis/Training/training_catalog.htm, for the training calendar in multiple formats see www.metrokc.gov/gis/Training/training_calendar.htm, for registration and FAQ's see (www.metrokc.gov/gis/Training/training_register_2007.htm), and for location information see www.metrokc.gov/gis/Training/training_location.htm.

A website is of course passive, so other methods are needed to push the marketing message (usually synthesized from material already on the web site) to targeted audiences, or to replicate KCGIS marketing material via other websites or media that would likely be accessed by our target market.

Current and Planned Alternate Media:

- Listing on Washington GIS Community Training Forum: waurisa.org/phpBB2/index.php.
- Listing on Association of Washington Cities (AWC) Training Calendar: www.awcnet.org/portal/StudioNew.asp?webid=1&mode=B1.
- Listing on GIS Certification Institute website: www.gisci.org/Events_and_Groups/state_local_gis_groups.htm#Washington.
- Listing KCGIS Center as WAURISA Sponsor on website (www.waurisa.org/sponsors.html) and via Summit Newsletter (www.waurisa.org/thesummit/index.html).
- During the past year our website has been enhanced to add logos for training partners (ESRI, NOAA, and GISCI). Planned for the future will be to add a Washington Department of Personnel logo to reflect our being a training provider for that organization.
- For 2007, listing on the GIS Yellow Pages (www.gisyellowpages.com/) will be considered for marketing KCGIS training.

Current and Planned Target Marketing:

- Monthly notification to Executive's Office to include upcoming GIS training announcement in bi-monthly e-mails to all county staff.

- Monthly e-mails to zzGrp, GIS_All.
- Monthly e-mails to Central Puget Sound GIS Users Group list server.
- Planned: KCGIS Center booth at GIS in Action and Washington State GIS conferences.
- Planned: KCGIS Center services video for KCTV and other public-access stations.
- Planned: iMap training video (pilot).

KCGIS User Training Needs Survey

The original plan for the development of the GIS training curriculum, including categorizing users and identifying skills sets, was based on a 2004 survey of county GIS users. A total of 482 users responded to the original survey, which was distributed to all names on the county e-mail zzGrp, GIS_All. It is assumed that many users included in the original survey have left the county, many new users have joined, job duties and GIS skill levels of existing users have matured, and the spread of web-mapping capability through the county may have resulted in the number of regular GIS users being double or more the number surveyed in 2004. For these reasons the GIS Training Workgroup has decided to conduct another survey in the later part of 2007. Results of this survey will be used to help with development of the 2008 training curriculum plan.

The survey planned for 2007 would have four major objectives:

1. Reassess skill levels and perceived skill development needs for desktop GIS users.
2. Assess skill levels and perceived skill development needs of web-based GIS users.
3. Assess familiarity and reaction to past KCGIS training program marketing.
4. Assess and rate KCGIS training (success, suitability, and value as compared with other training).

GIS Skill Sets by User Category

Skill sets required or desirable for each GIS user category provide the basis for defining the GIS courses included in the training curriculum. The following tables show the cross-links from each identified skill to the KCGIS or ESRI courses that provide the skills training. KCGIS courses are listed with the course number in parentheses. All other listings are ESRI courses. The coursework identified in the tables is not intended to be all-inclusive, as other training resources may apply as well.

Data User

Skill	Supporting Coursework
iMAP and Parcel Viewer User	
Using iMAP, Parcel Viewer	• Using iMAP (B-1) • Web-Based Property Research (XT-2)
Querying data	• Using iMAP (B-1)
Finding and using metadata	• Exploring KCGIS Data Using Metadata (B-2)
Exporting data and maps to business documents	• Exporting Data and Maps to Business Applications (B-3)
ArcView User (versions 3.x and 9.x)	
Using ArcView 3.x	• Introduction to ArcView 3.x (B-8) • Introduction to ArcView 3.x
Using ArcView 9.x	• Using ArcView 9.x (B-5) • Learning ArcGIS Desktop • Learning GIS Using ArcGIS Desktop • Making Better Map Layouts with ArcGIS • Migrating from ArcView 3.x to ArcGIS Desktop • The 15-Minute Map: Creating a Basic Map in ArcMap
Applying cartographic standards	• Cartographic Standards for King County GIS Users (B-7)
Finding data	• Using ArcView 9.x (B-5)
Finding and using metadata	• Exploring KCGIS Data Using Metadata (B-2)
Understanding and using Assessor's data (optional, depending on type of work)	• Using King County Assessor's Data (XT-3)
Understanding and using census data (optional, depending on type of work)	• KCGIS Census Resources (XT-4)
Finding, understanding, and using imagery	• Using ArcView 9.x (B-5)
Finding GIS resources (KCGIS knowledge base, ESRI, Internet)	• Handled as annual discussion topic at KCGIS User Group meeting.
Querying data	• Using ArcView 9.x (B-5)
Exporting data and maps to business documents	• Exporting Data and Maps to Business Applications (B-3)

Data Analyst

All skills from Data User (ArcView Users Section), PLUS:

Skill	Supporting Coursework
Using ArcGIS (ArcMap, ArcCatalog, ArcToolbox)	• Keeping Up With ESRI (XT-6) • Introduction to ArcGIS I • Introduction to ArcGIS II • ArcGIS Annotation: Tips and Tricks • Understanding GIS Queries • Using ArcCatalog: Tips and Tricks • What' New in ArcGIS Desktop at 9.2 • Working with Map Topology in ArcGIS • Introduction to the Multiuser Geodatabase
Understanding and using coordinate systems and projections	• Essentials for Editing and Analysis with ArcGIS (EA-1) • Understanding Map Projections and Coordinate Systems • Working with Map Projections and Coordinate Systems in ArcGIS
Understanding and using geoprocessing tools	• Geoprocessing for Analysts (EA-9) • Advanced Analysis with ArcGIS • Geoprocessing Using ModelBuilder • Geoprocessing with ArcGIS Desktop • Introduction to Geoprocessing Scripts Using Python
Understanding and using table relations	• Using ArcView 9.x (B-5)
Managing and organizing data	• Basics of the Geodatabase Data Model • Turning Data into Information Using ArcGIS 9
Raster manipulation (overlay, classification)	• Learning ArcGIS 9 3D Analyst • Learning ArcGIS 9 Spatial Analyst • Working with ArcGIS Spatial Analyst • Working with Rasters in ArcGIS 9
Visualizing and presenting data and information using more advanced cartographic techniques	• The Art and Science of Cartography (XT-7) • Advanced Techniques for Labels and Annotation • Cartography with ArcGIS • Cartographic Design Using ArcGIS 9 • Introduction to Cartographic Representations in ArcGIS 9.2 • Labeling in ArcMap: Tips and Tricks • Managing Cartographic Data in the Geodatabase • What's New in ArcGIS 9 Labeling and Annotation
Converting data from one format to another; normalizing data	• Essentials for Editing and Analysis with ArcGIS (EA-1)
Geocoding	• Introduction to ArcGIS II
Performing quality control and error analysis for data	• Essentials for Editing and Analysis with ArcGIS (EA-1)
Understanding the basics of SQL	• The Basics of SQL (EA-8)

Skill	Supporting Coursework
Customizing the ArcGIS interface	• Customizing ArcGIS 9 • Customizing ArcMap: Easy Ways to Extend the Interface • Getting Started with Scripting in ArcGIS 9
Finding and using pre-existing scripts	• Customizing ArcGIS 9
Getting the most out of the ESRI knowledge base	• Handled as annual discussion topic at KCGIS User Group meeting.
Using GPS derived data	• Essentials for Editing and Analysis with ArcGIS (EA-1)
Basic project level data editing	• Editing in ArcGIS 9: Tips and Tricks • Editing in ArcGIS 9: Tips and Tricks II

Data Steward

All skills from Data Analyst, PLUS:

Skill	Supporting Coursework
Understanding the basics of SDE	• Introduction to the Multiuser Geodatabase • Data Management in the Multiuser Geodatabase
Editing data in the GDB: topology, rules, relationships	• Creating and Editing Geodatabase Features with ArcGIS 9 (for ArcEditor and ArcInfo) • Creating and Editing Geodatabase Topology with ArcGIS 9 (for ArcEditor and ArcInfo) • Creating and Editing Labels and Annotation • Data Production and Editing Techniques • Editing Spatial Data in ArcMap: Tips and Tricks • Working with Geodatabase Topology
Designing and creating GDB structure	• Building Geodatabases • Geodatabase Design Concepts • Working with Geodatabase Subtypes and Domains (for ArcEditor and ArcInfo)
Understanding and applying best practices for maintaining metadata	• King County GIS Metadata – Creation, Posting, Maintenance, and Best Practices (EA-2)
Creating and posting metadata - creation and posting (FGDC)	• King County GIS Metadata – Creation, Posting, Maintenance, and Best Practices (EA-2) • Creating and Maintaining Metadata Using ArcGIS Desktop • Metadata: Tips and Tricks
Posting data: procedures, checks, troubleshooting	• Data Posting to the King County Spatial Data Warehouse (EA-3)
Understanding data versioning	• Essentials for Editing and Analysis with ArcGIS (EA-1)

Developer

Understanding of, or at least exposure to, as many skills as possible from Data User, Data Analyst, and Data Steward, PLUS:

Skill	Supporting Coursework
Fluency in at least one of the following programming languages / platforms or technical areas (preferably 2 or more); exposure to others: ○ ArcObjects; Visual Basic; VBA; ArcXML; Python; XML; SQL (advanced); HTML; ASP; .NET; ArcIMS	• Exploring the VBA Environment • Getting Started with ArcObjects in ArcGIS • Introduction to Programming ArcObjects with VBA • Introduction to ArcIMS • Introduction to Geoprocessing Scripts Using Python • Writing Advanced Geoprocessing Scripts Using Python • *Self directed learning*
Understanding of programming structures	• Learning Visual Basic for Applications for New ArcGIS Developers • Understanding Branching and Looping in VBA • Working with Forms in VBA • Working with Variables and Functions in VBA • *Self directed learning*
Developing applications (as opposed to scripts)	• Developing Applications with ArcGIS Server Using the Microsoft .NET Framework • Migrating to VB .NET • *Self directed learning*
Understanding and applying software life cycle principles (requirements, design, testing, deployment, implementation, etc.)	• *Self directed learning*
Understanding of OOP programming principles	• *Self directed learning*
Customizing ArcGIS (topics more advanced than for Data Analyst)	• Customizing ArcGIS 9 • Extending ArcGIS Desktop Applications
Understanding and applying usability practices to create good GUI design	• *Self directed learning*
Creating and maintaining technical documentation for applications	• Best Practices for King County GIS Programmers (C-1)
Dealing with interoperability issues	• *Self directed learning*
Creating and administering ArcIMS websites	• ArcIMS Administration • ArcIMS Best Practices: Optimizing Map Configuration Files • Customizing ArcIMS • Introduction to ArcIMS • Learning ArcIMS
Creating, administering, and deploying GIS Web services	• Introduction to ArcGIS Server
Administering SDE Geodatabases	• Data Management in the Multiuser Geodatabase • Introduction to Geodatabase Replication at ArcGIS 9.2 • Managing Editing Workflows in a Multiuser Geodatabase • Understanding the ArcSDE Spatial Index

Decision Maker

Skill	Supporting Coursework
Understanding what GIS is and what it can do	• What is GIS? (N-2) • Using GIS in Your Business (N-3)
Governance structure	• GIS at King County (N-4)
GIS Operations and Maintenance Plan	• GIS at King County (N-4)
Best Practices for managing GIS projects	• Using GIS in Your Business (N-3)
Available KCGIS Web resources	• GIS at King County (N-4)
Working with KCGIS Center Client Services	• GIS at King County (N-4)
Matrix management principles	• GIS at King County (N-4)
Clarifying GIS needs and choosing GIS services (i.e., reading the county's GIS menu of services)	• GIS at King County (N-4)

Database/System Administrator

Courses to support this user category have been dropped from the GIS curriculum. It is advised that non-GIS database and system administrators consult with the KCGIS Center Enterprise Technical Operations (ETO) Group when needing assistance with GIS data or software.

Skill	Supporting Coursework
Database Administrator	
General understanding of the theory and practice of SDE	• Consult with KCGIS Center ETO
Hardware and database requirements needed to run SDE	• Consult with KCGIS Center ETO
Backup / recovery of databases using SDE	• Consult with KCGIS Center ETO
When you can/cannot use the SQL command prompt to manipulate SDE files	• Consult with KCGIS Center ETO
Performance tuning	• Consult with KCGIS Center ETO
System Administrator	
File-based GIS (i.e. shapefiles)	• Consult with KCGIS Center ETO
What is an info file and why you shouldn't touch it	• Consult with KCGIS Center ETO
When you can/cannot use OS commands on file-based GIS files	• Consult with KCGIS Center ETO
Data / file types used in ArcGIS	• Consult with KCGIS Center ETO
Hardware and OS requirements for server and workstation GIS	• Consult with KCGIS Center ETO
Backup / recovery of GIS files	• Consult with KCGIS Center ETO
Licensing	• Consult with KCGIS Center ETO
Printing issues; dealing with large-format printers and ArcGIS	• Consult with KCGIS Center ETO
Basic, low-level troubleshooting	• Consult with KCGIS Center ETO

GIS Training Curriculum by User Category

The recommended curriculum for each GIS user category is provided below. Students should bypass courses if they already have the skills taught in that course. Students are encouraged to take courses in other categories, providing they have the proper prerequisite skills, the business need, and the approval of their supervisor.

Data User

Core Curriculum (Web-based user)

- Using iMAP (B-1)
- Web-Based Property Research (XT-2)
- Exploring KCGIS Data Using Metadata (B-2)

Core Curriculum (ArcView user)

- Using ArcView 9.x (B-5)
- Exploring KCGIS Data Using Metadata (B-2)
- Cartographic Standards for King County GIS Users (B-7)

Additional Curriculum

- Introduction to ArcView 3.x (B-8)
- Exporting Data and Maps to Business Applications (B-3)
- Finding GIS Resources (XT-1)
- Using King County Assessor's Data (XT-3)
- KCGIS Census Resources (XT-4)
- Introduction to ArcView 3.x
- Learning ArcGIS Desktop
- Learning GIS Using ArcGIS Desktop
- Making Better Map Layouts with ArcGIS
- Migrating from ArcView 3.x to ArcGIS Desktop
- The 15-Minute Map: Creating a Basic Map in ArcMap

Data Analyst

The core curriculum from Data User (ArcView) PLUS:

Core Curriculum

- Essentials for Editing and Analysis with ArcGIS (EA-1)
- Geoprocessing for Analysts (EA-9)
- Introduction to ArcGIS I
- Introduction to ArcGIS II
- Advanced Analysis with ArcGIS
- Turning Data into Information Using ArcGIS 9
- Understanding Map Projections and Coordinate Systems
- Working with Map Projections and Coordinate Systems

Additional Curriculum

- Basics of SQL (EA-8)
- Managing Table Relationships without Getting Dumped (EA-7)
- Keeping Up With ESRI (XT-6)
- GIS for Emergency Operations (RCECC volunteers only) (XT-5)
- The Art and Science of Cartography (XT-7)
- ArcGIS Annotation: Tips and Tricks
- Understanding GIS Queries
- Using ArcCatalog: Tips and Tricks
- What' New in ArcGIS Desktop at 9.2
- Working with Map Topology in ArcGIS

- Introduction to the Multiuser Geodatabase
- Geoprocessing Using ModelBuilder
- Geoprocessing with ArcGIS Desktop
- Introduction to Geoprocessing Scripts Using Python
- Basics of the Geodatabase Data Model
- Learning ArcGIS 9 3D Analyst
- Learning ArcGIS 9 Spatial Analyst
- Working with ArcGIS Spatial Analyst
- Working with Rasters in ArcGIS 9
- Advanced Techniques for Labels and Annotation
- Cartography with ArcGIS
- Cartographic Design Using ArcGIS 9
- Introduction to Cartographic Representations in ArcGIS 9.2
- Labeling in ArcMap: Tips and Tricks
- Managing Cartographic Data in the Geodatabase
- What's New in ArcGIS 9 Labeling and Annotation
- Customizing ArcGIS 9
- Customizing ArcMap: Easy Ways to Extend the Interface
- Getting Started with Scripting in ArcGIS 9
- Editing in ArcGIS 9: Tips and Tricks
- Editing in ArcGIS 9: Tips and Tricks II

Data Steward

The core curriculum from Data Analyst, PLUS:

Core Curriculum

- Data Posting to the King County Spatial Data Warehouse (EA-3)
- King County GIS Metadata – Creation, Posting, Maintenance, and Best Practices (EA-2)
- Introduction to the Multiuser Geodatabase
- Data Management in the Multiuser Geodatabase
- Building Geodatabases
-

Additional Curriculum

- Creating and Editing Geodatabase Features with ArcGIS 9 (for ArcEditor and ArcInfo)
- Creating and Editing Geodatabase Topology with ArcGIS 9 (for ArcEditor and ArcInfo)
- Creating and Editing Labels and Annotation
- Data Production and Editing Techniques
- Editing Spatial Data in ArcMap: Tips and Tricks
- Working with Geodatabase Topology
- Geodatabase Design Concepts
- Working with Geodatabase Subtypes and Domains (for ArcEditor and ArcInfo)
- Creating and Maintaining Metadata Using ArcGIS Desktop
- Metadata: Tips and Tricks

Developer

The core curriculum from Data User, Data Analyst, and Data Steward as applicable, PLUS:

Core Curriculum

- Best Practices for King County GIS Programmers (C-1)
- Introduction to ArcIMS
- Introduction to Programming ArcObjects with VBA
- Writing Advanced Geoprocessing Scripts Using Python
- Developing Applications with ArcGIS Server Using the Microsoft .NET Framework

- Introduction to ArcGIS Server

Additional Curriculum

- Exploring the VBA Environment
- Getting Started with ArcObjects in ArcGIS
- Learning Visual Basic for Applications for New ArcGIS Developers
- Understanding Branching and Looping in VBA
- Working with Forms in VBA
- Working with Variables and Functions in VBA\
- Migrating to VB .NET
- Extending ArcGIS Desktop Applications
- ArcIMS Administration
- ArcIMS Best Practices: Optimizing Map Configuration Files
- Customizing ArcIMS
- Learning ArcIMS
- Introduction to Geodatabase Replication at ArcGIS 9.2
- Managing Editing Workflows in a Multiuser Geodatabase
- Understanding the ArcSDE Spatial Index

Decision Maker

Core Curriculum

- What is GIS? (N-2)
- Using GIS in Your Business (N-3)
- GIS at King County (N-4)

Additional courses

- Web-Based Property Research (XT-2)
- Using iMAP (B-1)

Database/System Administrator

Core Curriculum (DBA)

- GIS at King County (N-4)

Core Curriculum (System Administrator)

- GIS at King County (N-4)

Additional courses

- Using iMAP (B-1)
- Exploring KCGIS Data Using Metadata (B-2)

Course Listings

Courses are listed in logical groupings of GIS Basics, Editing and Analysis, Customizing ArcGIS, Extending Your Knowledge, and GIS for Non-GIS Professionals. The course groupings are somewhat analogous to the GIS User Categories, as each grouping targets specific users as outlined in the following table.

Course Grouping	Targeted Students
GIS Basics	Data Users; possibly some Decision Makers and Database/System Administrators.
Editing and Analysis	Data Analysts; Data Stewards; some courses are appropriate for Developers; some courses are appropriate for advanced Data Users.
Customizing ArcGIS	Developers; some courses are appropriate for Data Stewards and Data Analysts.
Extending Your Knowledge	These courses are less specific to user categories and many are appropriate for all students.
GIS for Non-GIS Professionals	Decision Makers and Database/System Administrators

Key to course listings:

Designation: For custom courses only. Indicates course number for reference and tracking purposes.

Scope: For custom courses it indicates whether or not the course is offered to the public or is intended for King County employees only. For ESRI courses it indicates the type of offering (such as instructor-led or on-line seminar).

Location: For custom courses only. Indicates where the course can be taught. "Portable" means the course can travel; “Internet” means the course requires an Internet connection but otherwise can travel; “Workstation” means that students need to use computers during the course; “KSC Training Facility” means the course must be taught in the King Street Center computer training facility.

Offered: For custom courses only. Indicates how often the course is offered.

Refresher Interval: For custom courses only. Indicates recommended frequency that a student should take the course.

Status: For custom courses only. Provides information regarding status of course development.

GISCI Points: For custom courses only. Indicates points earned for GISP certification upon completion of course.

Note: Course listings shaded in gray are ESRI offerings. KCGIS instructors are authorized to teach Introduction to ArcView 3.x, Introduction to ArcGIS I, and Introduction to ArcGIS II.

GIS Basics

Title: Using iMAP **Designation**: B-1
Scope: Public **Location**: Internet
Description: Hands-on introduction to the iMAP interface. Includes definitions of the map sets, basic navigation and tools overview, map layout, export and printing, and advanced query and analysis tools.
Course Length: Half day **Cost**: TBD
Offered: Quarterly **Refresher Interval**: Major release
Status: Course exists as a free one hour “brown bag” that has been taught for several years. It needs to be redeveloped as a longer course to cover greater detail on iMAP functions and tools. A pilot project to produce an instructional iMap video is being pursued in 2007.
GISCI Points: 0.10 (if expanded to half day)

Title: Exploring KCGIS Data Using Metadata **Designation**: B-2
Scope: Public **Location**: Internet
Description: How to find and understand King County GIS metadata. Includes accessing metadata from the Internet and applicable KCGIS tools (e.g. iMAP), metadata location and organization on the Web, metadata format, finding the data steward, and a brief introduction to the FGDC standard.
Course Length: One hour **Cost**: Free
Offered: Quarterly **Refresher Interval**: Once
Status: Complete.
GISCI Points: None.

Title: Exporting Data and Maps to Business Applications **Designation**: B-3
Scope: Public **Location**: Portable
Description: How to export tabular information and maps presented in GIS applications to business applications such as MS Excel, MS Word, and HTML. Includes a brief discussion of exporting images (.JPG and .GIF).
Course Length: One hour **Cost**: TBD
Offered: Annually **Refresher Interval**: Once
Status: Currently under development in 2007.
GISCI Points: None.

Title: Using ArcView 9.x **Designation**: B-5
Scope: Public **Location**: KSC Training Facility
Description: Covers fundamental GIS concepts as well as how to create, edit, and georeference spatial data. Attendees learn how to manipulate tabular data, query a GIS database, and present data clearly and efficiently using maps and charts. Using KCGIS enterprise data access applications students will learn to access, query, and display King County's GIS vector and raster data.
Course Length: Two days **Cost**: TBD
Offered: Quarterly **Refresher Interval**: Once
Status: Currently under development in 2007.
GISCI Points: 0.40

Title: Cartographic Standards for KCGIS Users **Designation**: B-7
Scope: Internal **Location**: N/A
Description: This document provides information on the King County GIS cartographic standards, and how to correctly apply the standards to map layouts. Reference and orientation to the document is included in many KCGIS courses.
Course Length: N/A **Cost**: Free
Offered: N/A **Refresher Interval**: Major release
Status: Document currently available on KCGIS Center website.

Title: Introduction to ArcView 3.x **Designation**: B-8
Scope: Public **Location**: KSC Training Facility
Description: This course provides an overview and hands-on experience using ArcView 3.x. It teaches basic ArcView functionality and enables participants to use the software's powerful display and analysis capabilities. Attendees use ArcView to create, edit, display, query, and analyze geographic and tabular data and create presentation-quality maps and charts.
Course Length: 2 days **Cost**: $450
Offered: Twice per year **Refresher Interval**: Once
Status: This course is authorized by ESRI and students completing instruction will receive an ESRI certificate. KCGIS is phasing out support for ArcView 3.x. If at all possible users are encouraged to pursue training in the ArcGIS 9.x environment.
GISCI Points: 0.40

Title: Introduction to ArcGIS I
Scope: ESRI Instructor-Led course (classroom) **Cost**: $950 from ESRI; $450 from KCGIS
Description: This course provides the foundation for becoming a successful ArcGIS Desktop user. Students learn fundamental GIS concepts and become familiar with the range of functionality available in the software.

Title: Introduction to ArcView 3.x
Scope: ESRI Virtual Campus course **Cost**: $125
Description: This course provides the foundation for becoming a successful ArcView 3.x software user. Students learn how to create, display, and manipulate spatial and tabular data. In addition, the course shows how to use ArcView spatial analysis tools to solve many common GIS problems and how to present data in a clear and efficient manner using maps and charts.

Title: Learning ArcGIS Desktop
Scope: ESRI Virtual Campus course **Cost**: $175
Description: This course introduces fundamental concepts of GIS and the major functionality contained within ArcGIS Desktop software. In course exercises, students follow the GIS analytical process and work with a variety of tools to solve realistic problems. This course emphasizes practical GIS skills.

Title: Learning GIS Using ArcGIS Desktop
Scope: ESRI Instructor-Led course (classroom) **Cost**: $950
Description: This course provides the foundation for understanding what GIS is, what it can do, and how others are using it. Students learn the basic functions of a GIS, the properties of GIS maps, why a GIS database is powerful, what coordinate systems and map projections are and why they are important, two common GIS data structures, and where geographic data is obtained and how it is made.

Title: Making Better Map Layouts with ArcGIS
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This seminar reviews layout basics and then provides additional information on how to create more graphically pleasing and professional-looking maps using tools and settings in ArcMap. The seminar concludes with a brief section on map output.

Title: Migrating from ArcView 3.x to ArcGIS Desktop
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This course introduces ArcView 3.x users to the features and architecture of ArcGIS Desktop software. Students learn how the ArcGIS terminology and features compare with ArcView 3.x and work with ArcCatalog and ArcMap to see how these ArcGIS applications work together to provide a complete GIS software solution.

Title: The 15-Minute Map: Creating a Basic Map in ArcMap
Scope: ESRI Virtual Campus course **Cost**: $25
Description: This focused course teaches how to use ArcMap templates to streamline map creation. Students learn how to identify map element properties and defaults, how to modify elements while maintaining proper cartographic design principles, and how to add elements to layouts to create custom ArcMap templates.

Editing and Analysis

Title: Essentials for Editing and Analysis with ArcGIS **Designation**: EA-1
Scope: Public **Location**: KSC Training Facility
Description: Basics of ArcMap, ArcCatalog, and other components of the ArcGIS toolbox. Uses county data and examples to explore basic and advanced editing tasks. Includes instruction on coordinate systems and projections, data versioning, and using GPS derived data.
Course Length: 2 days **Cost**: TBD
Offered: Twice per year **Refresher Interval**: Once
Status: Currently under development with completion scheduled for March 2007.
GISCI Points: 0.40

Title: King County GIS Metadata – Creation, Posting, Maintenance, and Best Practices
Designation: EA-2
Scope: Internal **Location**: KSC Training Facility
Description: Provides technical information for creating and maintaining King County GIS metadata to meet county standards. Generally offered back-to-back with "Data Posting to the King County Spatial Data Warehouse".
Course Length: 4 hours **Cost**: $150
Offered: Annually **Refresher Interval**: Once
Status: Complete.
GISCI Points: 0.10

Title: Data Posting to the King County Spatial Data Warehouse
Designation: EA-3
Scope: Internal **Location**: KSC Training Facility
Description: Provides technical information for posting, verifying, and troubleshooting data updates to the SDW. Organization of SDW is reviewed. Generally offered back-to-back with "King County GIS Metadata – Creation, Posting, Maintenance, and Best Practices."
Course Length: 2 hours **Cost**: $125
Offered: Annually **Refresher Interval**: Once
Status: Complete.
GISCI Points: 0.05

Title: Managing Table Relationships Without Getting Dumped
Designation: EA-7
Scope: Public **Location**: KSC Training Facility
Description: This is a module within the Using ArcView 9.x custom course, but is designed to be taught separately if needed. Students learn basic theories of relating tables, how to work with primary and foreign key fields, and how to create, use, and manage table relationships in ArcGIS.
Course Length: N/A **Cost**: N/A
Offered: N/A **Refresher Interval**: Once
Status: Module is currently in development in 2007.

Title: The Basics of SQL **Designation**: EA-8
Scope: Public **Location**: Portable
Description: How to use SQL to create queries. Understanding common commands, syntax and usage.
Course Length: Two hours **Cost**: $100
Offered: Twice per year **Refresher Interval**: Once
Status: Complete.
GISCI Points: 0.05

Title: Geoprocessing for Analysts **Designation**: EA-9
Scope: Public **Location**: KSC Training Facility
Description: Covers the ArcGIS Toolbox, Geoprocessing Tools, the Command Line, and Model Builder. Includes customization of the geoprocessing environment toolbox, and familiarizes students with tools to complete a real world GIS analysis project.
Course Length: Six hours **Cost**: $185
Offered: Annually **Refresher Interval**: Once
Status: Complete.
GISCI Points: 0.15

Title: Advanced Analysis with ArcGIS
Scope: ESRI Instructor-Led course (classroom) **Cost**: $1425
Description: This course examines modeling techniques used in spatial analysis and introduces processes and tools that can be used to perform a variety of GIS analysis tasks. The ArcGIS geoprocessing framework, which includes ArcToolbox, ModelBuilder, the command line, and scripts, is emphasized.

Title: Advanced Techniques for Labels and Annotation
Scope: ESRI Instructor-Led course (web) **Cost**: $550
Description: This course presents advanced strategies for efficiently manipulating labels and annotation so they display properly without hours of detailed work. Students learn how to customize label appearance and text using ArcGIS tools and sample code. The course also introduces label placement using the Maplex extension.

Title: ArcGIS Annotation: Tips and Tricks
Scope: ESRI Virtual Campus course **Cost**: $25
Description: In this workshop, participants learn how to convert labels to annotation, create geodatabase annotation feature classes, modify annotation, create feature-linked annotation, and convert coverage annotation to geodatabase annotation.

Title: Basics of the Geodatabase Data Model
Scope: ESRI Virtual Campus course **Cost**: $25
Description: This course introduces the basic components of a geodatabase – tables, feature classes, feature datasets, and relationships. Students learn how geographic data is stored in each of the four components.

Title: Cartographic Design Using ArcGIS 9
Scope: ESRI Virtual Campus course **Cost**: $150
Description: This course discusses key design issues and teaches practical guidelines for creating maps that are well suited to their display medium and that speak effectively to their audience. Students learn fundamental design principles and practice with the ArcGIS Desktop tools for creating high-quality maps.

Title: Creating and Editing Geodatabase Features with ArcGIS 9 (for ArcEditor and ArcInfo)
Scope: ESRI Virtual Campus course **Cost**: $50
Description: This course teaches how to build a geodatabase from the ground up. Students learn how to utilize ArcMap's standard and advanced tools to create and edit simple and complex features as well as feature-linked and dimension annotation. Additionally, students learn how to work with features using coordinate geometry (COGO) descriptions and survey measurements.

Title: Creating and Editing Geodatabase Topology with ArcGIS 9 (for ArcEditor and ArcInfo)
Scope: ESRI Virtual Campus course **Cost**: $50
Description: This course explains how topology is implemented in the geodatabase and teaches how to use geodatabase topology to more accurately model the real world.

Title: Creating and Editing Labels and Annotation
Scope: ESRI Virtual Campus course **Cost**: $50
Description: This course teaches how to create labels and annotation, as well as how to manage them to streamline map creation. The hands-on exercises illustrate a variety of processes for resolving realistic labeling challenges.

Title: Creating and Maintaining Metadata Using ArcGIS Desktop
Scope: ESRI Virtual Campus course **Cost**: $75
Description: This course shows how metadata supports efficient management and use of spatial data and teaches practical strategies for creating and maintaining metadata using ArcGIS Desktop software. Students learn how to write proper metadata using tools in ArcCatalog and how to automate metadata workflows using templates.

Title: Creating, Editing, and Managing Geodatabases for ArcGIS 9
Scope: ESRI Virtual Campus course **Cost**: $75
Description: This course covers all the basics and introduces the more advanced functionality that makes the geodatabase such a powerful data model. Students will be able to get started working with geodatabases right away and understand the range of functionality that the geodatabase offers.

Title: Data Production and Editing Techniques
Scope: ESRI Instructor-Led course (classroom) **Cost**: $1425
Description: Using the tools available with ArcGIS software, students learn techniques for data preparation, conversion, and editing. They also learn how topology and other geodatabase validation rules help maintain data integrity as part of an editing workflow. This course teaches practical methods for working with spatial and attribute data with an emphasis on data stored in the geodatabase.

Title: Editing Spatial Data in ArcMap: Tips and Tricks
Scope: ESRI Virtual Campus course **Cost**: $25
Description: This course provides useful tips and tricks for editing shapefile and geodatabase feature classes in ArcMap. Students learn about some of the lesser-known but powerful tools available from the Editor toolbar, the editing functions available from ArcMap context menus, and how to work efficiently with feature sketches.

Title: Editing in ArcGIS 9: Tips and Tricks,
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This seminar provides useful tips and tricks for working with editing tools and sketches to construct vector geometry. The presenter will demonstrate data production techniques for edge matching and rubber sheeting as well as useful developer samples.

Title: Editing in ArcGIS 9: Tips and Tricks II
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This course explores common editing challenges in ArcMap, then reveals and demonstrates their solutions. This seminar highlights tips and tricks for working with sketches and subdividing lines.

Title: Geodatabase Design Concepts
Scope: ESRI Virtual Campus course **Cost**: $950
Description: This course explains the steps involved in the geodatabase design process, from preliminary planning to schema creation. Students learn how to take advantage of existing ArcGIS data models and become familiar with data modeling techniques. A review of basic geodatabase concepts is included.

Title: Introduction to ArcGIS II
Scope: ESRI Virtual Campus course **Cost**: $1425 from ESRI; $575 from KCGIS
Description: In this course, students extend their ArcGIS skills in the areas of cartography, data automation and editing, and geoprocessing and spatial analysis. Students work with advanced cartographic tools as they learn how to efficiently create effective maps. A major focus of the course is the geodatabase. Students learn database design considerations and techniques for creating, maintaining, and managing GIS data stored in a geodatabase. The ArcGIS geoprocessing tools for spatial analysis are also covered.

Title: Labeling in ArcMap: Tips and Tricks
Scope: ESRI Virtual Campus course **Cost**: $25
Description: This focused course teaches advanced labeling techniques in ArcMap.

Title: Metadata: Tips and Tricks
Scope: ESRI Virtual Campus course **Cost**: Free
Description: The presenter will demonstrate how to take advantage of metadata tools and will share tips for making your daily metadata workflow more efficient.

Title: Understanding GIS Queries
Scope: ESRI Virtual Campus course **Cost**: $25
Description: This course teaches how to construct spatial and attribute queries using ArcGIS software. The basic elements of a query are defined and query-building tools are introduced.

Title: Understanding Map Projections and Coordinate Systems
Scope: ESRI Virtual Campus course **Cost**: $125
Description: This course introduces the fundamental concepts behind map projections and coordinate systems. Essential characteristics of all map projections – aspect, perspective, and distortion-are discussed. The emphasis is on theory, but students gain practical experience working with ArcGIS software to apply map projections, modify their properties, and manipulate data stored in different coordinate systems.

Title: Using ArcCatalog: Tips and Tricks
Scope: ESRI Virtual Campus course **Cost**: $25
Description: This course provides an overview of ArcCatalog's tools and advanced operations, and introduces improved methods for managing and searching both spatial and nonspatial data.

Title: What's New in ArcGIS 9 Labeling and Annotation
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This training seminar highlights enhancements to the labeling and annotation functionality in ArcGIS 9. The presenter addresses the significant changes for managing labels by introducing the improved user interface, map-based labeling, the Label Manager, and new core functionality.

Title: What's New in ArcGIS Desktop at 9.2
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This seminar introduces new methods of navigating the ArcMap interface, improved ways to display data, and enhancements to ArcCatalog and the ArcGIS Desktop Help documentation. It will also cover software enhancements to working with tables, editing features, working with labels and annotation, and creating graphs with the new graph wizard, as well as the introduction of cartographic representations, a new way to link specific symbology settings to the data to which they apply.

Title: Working with Geodatabase Subtypes and Domains (for ArcEditor and ArcInfo)
Scope: ESRI Virtual Campus course **Cost**: $25
Description: This focused course teaches how to create and apply subtypes and domains to organize data and establish attribute validation rules in a geodatabase.

Title: Working with Geodatabase Topology
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This seminar is for ArcGIS users who want to learn how to use geodatabase topology to help insure the integrity of their data.

Title: Working with Map Projections and Coordinate Systems in ArcGIS
Scope: ESRI Virtual Campus course **Cost**: Free
Description: In this seminar, the presenter discusses geographic and projected coordinate systems, how to determine the coordinate system for a dataset, and how to apply a geographic (datum) transformation.

Title: Working with Map Topology in ArcGIS
Scope: ESRI Virtual Campus course **Cost**: $25
Description: This focused course provides an overview of map topology and gives ArcView users a foundation for working with map topology tools.

Title: Working with Rasters in ArcGIS 9
Scope: ESRI Virtual Campus course **Cost**: $75
Description: This course unlocks the mysteries of the raster. Students learn which types of geographic phenomena are appropriately represented as rasters and how the type of data affects raster analysis.

Customizing ArcGIS

Title: Best Practices for King County GIS Programmers **Designation**: C-1
Scope: Internal **Location**: Portable
Description: Document provides a series of guidelines for KCGIS programmers. Includes standards, best practices, procedures, and protocols for GIS programmers to enhance collaboration and efficiency.
Course Length: N/A **Cost**: N/A
Offered: N/A **Refresher Interval**: Annually
Status: To be developed by the KCGIS Application/Developers Group in 2007.

Title: Building Applications with ArcGIS Server Using the Microsoft .NET Framework
Scope: ESRI Web Seminar **Cost**: Free
Description: This seminar discusses how users can build applications using the Web Application Developer Framework (ADF) to leverage GIS Web services from a variety of providers like ArcGIS Server, ArcIMS, or WMS.

Title: Customizing ArcGIS 9
Scope: ESRI Virtual Campus course **Cost**: $50
Description: The course covers how to rearrange basic elements of the interface, customize toolbars and menus, and create custom tools and buttons. Additionally, students learn how to locate and implement existing VBA code samples to add custom functionality.

Title: Customizing ArcMap: Easy Ways to Extend the Interface
Scope: ESRI Virtual Campus course **Cost**: $25
Description: This course introduces easy ways to add custom functionality to the ArcMap interface. Using sample Visual Basic and VBA code, students learn how to add, remove, and rearrange toolbars and menus; create new buttons, tools, commands, and shortcut keys; and access commands that are not on the ArcMap interface.

Title: Developing Applications with ArcGIS Server Using the Microsoft .NET Framework
Scope: ESRI Virtual Campus course **Cost**: $1425
Description: This advanced course introduces the ASP.NET Web Application Developer Framework (ADF) and teaches how to build custom ArcGIS Server applications. Students learn about the available libraries, application programming interfaces (API), and server development guidelines, and how to develop different types of Web applications. In course exercises, students build applications ranging from ASP.NET Web applications that use the ADF Web controls to ArcGIS Explorer custom tasks and server object extensions. Students also learn how to extend the ADF with custom buttons and tools through the new task framework.

Title: Exploring the VBA Environment
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This course is the first in a series of focused courses on VBA. Students learn the basic components of VBA and the Visual Basic Editor, fundamental programming terminology, where VBA code is stored, how VBA code is structured, and how to access and work with Visual Basic Help.

Title: Extending ArcGIS Desktop Applications
Scope: ESRI Instructor-Led course (classroom) **Cost**: $1425
Description: This advanced course shows how to customize and extend ArcGIS applications by building custom COM components. Students learn the fundamentals of the application framework and the types of customizations that are possible. In course exercises, students build custom COM components and learn how to seamlessly integrate them into ArcGIS Desktop applications.

Title: Getting Started with ArcObjects in ArcGIS
Scope: ESRI Virtual Campus course **Cost**: Free
Description: In this seminar, students learn how to read and navigate the diagrams, and how to write your own VBA code with ArcObjects to customize the ArcGIS Desktop applications.

Title: Getting Started with Scripting in ArcGIS 9
Scope: ESRI Virtual Campus course **Cost**: Free
Description: In this training seminar, participants learn exactly what can be accomplished within the ArcGIS 9 scripting environment. All examples and demonstrations will use Python.

Title: Introduction to Geoprocessing Scripts Using Python
Scope: ESRI Instructor-Led course (classroom) **Cost**: $950
Description: This course introduces the Python scripting language and shows how it can be used to access and automate geoprocessing functionality. Students learn Python scripting syntax, and then begin writing scripts to automate geoprocessing operations. Students also learn how to incorporate Python scripts as custom tools in ArcToolbox.

Title: Introduction to Programming ArcObjects with VBA
Scope: ESRI Instructor-Led course (classroom) **Cost**: $2375
Description: This course provides a foundation for application development using Visual Basic for Applications (VBA) and ArcObjects. In course exercises, students create usable ArcObjects code for typical GIS programming tasks. Students work with VBA development tools and the ArcGIS Customize dialog box and learn how to access online help resources.

Title: Learning Visual Basic for Applications for New ArcGIS Developers
Scope: ESRI Virtual Campus course **Cost**: $125
Description: This course teaches the fundamental concepts of programming using Microsoft Visual Basic for Applications (VBA), the development environment used for customizing ArcGIS Desktop. Students learn and immediately apply object-oriented programming concepts as they develop VBA solutions from start to finish. This course is designed for those who are new to programming and want to learn essential programming techniques to write effective code.

Title: Migrating to VB .NET
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This seminar demonstrates how to convert a VB6 DLL application to VB .NET, including how to use ESRI Add-Ins to implement interfaces and register components with the Component Category Manager. The presenter also discusses issues relevant to ArcObjects and VB .NET, including namespaces, variable declaration, debugging, error handling, query interface, and garbage collection. In addition, the basics of distributing an ArcObjects VB .NET application are covered.

Title: Understanding Branching and Looping in VBA
Scope: ESRI Virtual Campus course **Cost**: $25
Description: This focused course is the fourth in the VBA series of focused courses and introduces the two branching methods (the If Then Else statement and the Select Case statement) and the two looping structures (the For Next loop and the Do loop) that are available in the VBA environment.

Title: Working with Forms in VBA
Scope: ESRI Virtual Campus course **Cost**: $25
Description: In this course, the third in the VBA series of focused courses, students learn exactly what VBA forms are, common uses of forms, the two parts of a form, how to design and write code to make new forms, and how to incorporate these forms into the ArcMap interface.

Title: Working with Variables and Functions in VBA
Scope: ESRI Virtual Campus course **Cost**: $25
Description: In this course students learn VBA syntax rules and code structure as they work with predefined functions, declare and calculate variables, and use variables with input boxes and message boxes.

Title: Writing Advanced Geoprocessing Scripts Using Python
Scope: ESRI Instructor-Led course (classroom) **Cost**: $1425
Description: This course teaches intermediate to advanced Python scripting techniques for the ArcGIS geoprocessing framework. Students begin by refining their Python scripting skills as they manipulate several key data types and create effective, reusable code. Students then apply these skills to execute custom geoprocessing functionality. The course covers how to incorporate Python scripts into the ModelBuilder environment and prepares students to leverage the full capabilities of Python scripting within the ArcGIS geoprocessing framework.

Extending Your Knowledge

Title: Finding GIS Resources
Designation: XT-1
Scope: Public
Location: Internet
Description: Annual presentation at KCGIS Users Group meeting. Provides orientation to GIS technical information available on the Internet using King County's, ESRI's and other websites.
Course Length: One hour
Cost: Free
Offered: Once per year
Refresher Interval: Annual
Status: Will be handled as annual topic at KCGIS Users Group meeting.

Title: Web-Based Property Research
Designation: XT-2
Scope: Public
Location: Workstation
Description: Hands-on introduction to the Parcel Viewer interface. Includes property search techniques, understanding the property page results, and where to go for more property information. Introduces the property research capabilities of iMAP.
Course Length: One hour
Cost: Free
Offered: Twice per year
Refresher Interval: Major release
Status: Currently exists as a free one hour "brown bag". It needs to be updated and formalized for inclusion in current curriculum.

Title: Using King County Assessor's Data
Designation: XT-3
Scope: Public
Location: Portable
Description: Introduction to the various Assessor tables and the data that they represent. Includes where to find Assessor's data, conversion techniques, and how to attach them to GIS data, query against them and create useful and informative maps. Users may take home Microsoft Access macros to aid in data conversion.
Course Length: Half day
Cost: TBD
Offered: Twice per year
Refresher Interval: Once
Status: Currently exists as a one day course, but needs to be updated and formalized for inclusion in current curriculum.
GISCI Points: TBD

Title: KCGIS Census Resources
Designation: XT-4
Scope: Public
Location: Portable
Description: Students learn to make effective use of King County 2000 Census data. This course will review the census geography and tabular data needed to perform basic analysis. It will also provide an introduction to the online Census Viewer interface.
Course Length: One hour
Cost: TBD
Offered: Twice per year
Refresher Interval: Once
Status: Course exists as a free one hour "brown bag" that has been informally taught for several years. It needs to be updated and formalized for inclusion in current curriculum.

Title: GIS for Emergency Coordination Center Volunteers
Designation: XT-5
Scope: Internal (ECC volunteers only)
Location: KSC Training Facility
Description: ECC volunteers will receive instruction in creating maps for various emergency scenarios. Volunteers will receive orientation and refresher information pertaining to manning the GIS workstation at the ECC during activation.
Course Length: Half day
Cost: TBD
Offered: Twice per year
Refresher Interval: Twice per year
Status: Course has been offered to ECC volunteers in the past. It needs to be updated for inclusion in current curriculum.
GISCI Points: 0.10

Title: Keeping Up with ESRI
Designation: XT-6
Scope: Public
Location: KSC Training Facility
Description: Covers changes and updates to the ArcGIS interface and functionality that will affect how users, analysts, and stewards interact with their GIS data and environment. Includes ample time for student Q&A.
Course Length: Half day
Cost: $150
Offered: Twice per year
Refresher Interval: Major Release
Status: Complete.
GISCI Points: 0.10

Title: The Art and Science of Cartography
Designation: XT-7
Scope: Public
Location: Portable
Description: Covers basic to advanced cartographic techniques for the casual mapmaker or GIS professional needing a refresher. Includes required map elements; proper text sizing, font conventions, and text placement; the effective use of color; legend creation; and tips on how to make a good-looking map without sacrificing content or time.
Course Length: Two hours
Cost: TBD
Offered: Annually
Refresher Interval: Once
Status: Recommended for development in 2007. Consideration is being given to expand this course to two days and increase the focus on advanced, high-end cartographic production.
GISCI Points: 0.05 (if two hours), 0.40 (if two days)

Title: ArcIMS Administration
Scope: ESRI Instructor-Led course (classroom)
Cost: $1425
Description: This seminar covers best practices for optimizing map configuration files and improving performance. Topics covered include methods to optimize map configuration files both inside and outside of Author and how to measure performance and find bottlenecks using the Spatial Server log files.

Title: ArcIMS Best Practices: Optimizing Map Configuration Files
Scope: ESRI Virtual Campus course
Cost: Free
Description: IN this course students learn how to protect and maintain ArcIMS servers and configure firewalls. Course topics include tuning ArcIMS services, setting up secure servers, applying hardware sizing, and important networking skills. Students learn advanced installation and configuration techniques with a focus on distributed installations. Creating, configuring, and monitoring ArcIMS connections to ArcSDE servers are also covered.

Title: Building Geodatabases
Scope: ESRI Instructor-Led course (classroom)
Cost: $1425
Description: This course provides an overview of the structure and capabilities of the geodatabase. Students learn how to create a geodatabase, migrate existing GIS data to a geodatabase, and edit and maintain data stored in a geodatabase. The course covers some advanced geodatabase topics including how to build a geodatabase topology; maintain data integrity using subtypes, attribute domains, and relationship classes; and create a geodatabase schema.

Title: Cartography with ArcGIS
Scope: ESRI Instructor-Led course (classroom)
Cost: $1425
Description: This course teaches basic principles of cartographic design and how to apply them using ArcGIS cartographic and geoprocessing tools to create outstanding maps. Students examine factors that control and influence cartographic design, learn techniques to best display vector and raster data, and create maps that communicate information effectively.

Title: Customizing ArcIMS
Scope: ESRI Virtual Campus course **Cost**: $50
Description: This course introduces ArcXML, the programming language of ArcIMS, and shows how ArcXML is an easy, yet powerful tool for customizing ArcIMS Web sites. Students explore the structure of ArcXML and learn how to modify ArcIMS Web sites using ArcXML as well as HTML and JavaScript.

Title: Data Management in the Multiuser Geodatabase
Scope: ESRI Instructor-Led course (classroom) **Cost**: $1425
Description: This course prepares GIS and database administrators to implement an ArcSDE geodatabase by teaching how to load and manage ArcSDE data. The course presents concepts applicable to both workgroup and enterprise ArcSDE geodatabases but focuses primarily on the enterprise ArcSDE geodatabase. Students learn the basic architecture of a multiuser geodatabase and are introduced to ArcSDE connection types. The course focuses on loading and managing vector and raster data and emphasizes best practices for interacting with a multiuser geodatabase. Students explore multiuser geodatabase design strategies and editing options for data stored in a multiuser geodatabase, including versioning.

Title: Geoprocessing Using ModelBuilder
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This seminar discusses how ModelBuilder can be used to create advanced procedures and workflows.

Title: Geoprocessing with ArcGIS Desktop
Scope: ESRI Virtual Campus course **Cost**: $100
Description: This course teaches practical strategies for using the ArcGIS geoprocessing framework to accomplish GIS workflows. Participants work with geoprocessing tools to create and organize workspaces, prepare data for analysis, and perform GIS analysis tasks, then learn how to streamline processes using models and scripts. Participants also learn how to create custom geoprocessing tools and the importance of documenting custom tools, scripts, and models.

Title: Introduction to ArcGIS Server
Scope: ESRI Instructor-Led course (classroom) **Cost**: $950
Description: This course introduces ArcGIS Server and teaches how to install, configure, and use the product as administrators and consumers of GIS services. Students learn how to publish maps, globes, and geoprocessing models that are optimized for performance. Students also create out-of-the-box Web applications using Manager and learn how to use GIS services in both Web applications and ArcGIS Explorer.

Title: Introduction to ArcIMS
Scope: ESRI Instructor-Led course (classroom) **Cost**: $950
Description: This course provides a comprehensive introduction to ArcIMS and its powerful capabilities. Students explore the structure of ArcIMS and learn how to create ArcIMS Web sites. The course also covers the options for client viewers and teaches how to configure ArcIMS Web sites and servers.

Title: Introduction to ArcIMS
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This seminar will provide an overview of ArcIMS, including its uses, architecture, and easy-to-use ArcIMS tools. The presenter will guide participants through the process of creating a GIS map for an ArcIMS Web site, creating and managing an ArcIMS service, and designing an ArcIMS viewer so that others can view, navigate, and query the map over the Internet.

Title: Introduction to Cartographic Representations in ArcGIS 9.2
Scope: ESRI Virtual Campus course **Cost**: Free
Description: ArcGIS 9.2 users will no longer need to export maps to a graphics program to manipulate individual feature symbols for improved cartographic outputs. This seminar introduces cartographic representations and discusses how they are stored in the geodatabase, how they are used in ArcMap and ArcCatalog to create professional-quality maps, and how they are managed using new geoprocessing tools.

Title: Introduction to Geodatabase Replication at ArcGIS 9.2
Scope: ESRI Virtual Campus course **Cost**: free
Description: Students will learn about functionality in ArcCatalog and ArcMap 9.2 that allows them to create and manage replica copies of the geodatabase in whole or in part, while maintaining the geodatabase objects' spatial characteristics.

Title: Introduction to the Multiuser Geodatabase
Scope: ESRI Instructor-Led course (classroom) **Cost**: $950
Description: This course, designed for the end user of a multiuser geodatabase, bridges the gap between the ArcSDE administrator and the GIS professional and shows how to leverage the powerful capabilities offered by the multiuser geodatabase. Students learn how to apply GIS skills in a multiuser environment and how the multiuser environment differs from the personal geodatabase for Microsoft Access environment. The course also discusses geodatabase functionality in the context of an editing environment, fundamental editing workflow procedures, and client-side performance considerations. This course does not focus on a specific supported RDBMS and is suitable for users working with personal, workgroup, and enterprise geodatabases.

Title: Learning ArcGIS 9 3D Analyst
Scope: ESRI Virtual Campus course **Cost**: $150
Description: This course teaches what a surface model is and shows how to create both raster and vector surfaces. Working mostly with models of terrain, students display surfaces in three-dimensional perspective, symbolize them, and set three-dimensional properties. Students also create realistic models by draping aerial photographs over surfaces and displaying two-dimensional features in three dimensions.

Title: Learning ArcGIS 9 Spatial Analyst
Scope: ESRI Virtual Campus course **Cost**: $125
Description: This course teaches how to use ArcGIS Spatial Analyst to produce and control raster data. Students create a variety of raster surfaces including hillshade relief maps, slope and aspect surfaces, and density and distance surfaces.

Title: Learning ArcIMS
Scope: ESRI Virtual Campus course **Cost**: $75
Description: This course provides an overview of the basic features and components of ArcIMS and teaches the skills needed to create a basic ArcIMS Web site from start to finish.

Title: Managing Cartographic Data in the Geodatabase
Scope: ESRI Instructor-Led course (classroom) **Cost**: $950
Description: This course explains what cartographic representations are and how they can be used to solve cartographic problems that were formerly difficult or impossible to solve in the ArcGIS environment. Students learn how to create symbology for different map purposes and scales without duplication and reprocessing of spatial data.

Title: Managing Editing Workflows in a Multiuser Geodatabase
Scope: ESRI Instructor-Led course (classroom) **Cost**: $1425
Description: This course provides an insider's look at how to manage editing workflows in a multiuser geodatabase. Students learn how to use the different editing environments and how to integrate these environments into their business workflow. This course teaches how to perform both non-versioned and versioned editing. Students learn how ArcSDE technology implements versioned and non-versioned editing through the use of geodatabase system metadata tables and user delta tables. Solid strategies for maintaining multiuser geodatabase performance are explored.

Title: Turning Data into Information Using ArcGIS 9
Scope: ESRI Virtual Campus course **Cost**: $125
Description: This course examines the scientific methods used to derive useful information from spatial data. Participants will explore GIS theory related to the visualization, measurement, transformation, and optimization of spatial data.

Title: Understanding ArcSDE Table Relationships
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This seminar teaches the various ways you can join data when querying an ArcSDE geodatabase, when to employ each method, and strategies for optimizing performance.

Title: Understanding the ArcSDE Spatial Index
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This training seminar provides an overview of the spatial index and teaches how to modify the index for increased performance.

Title: What's New in the Geodatabase at ArcGIS 9.2
Scope: ESRI Virtual Campus course **Cost**: Free
Description: This seminar provides an overview of the enhancements and new functionality for the geodatabase offered with ArcGIS 9.2.

Title: Working with ArcGIS Spatial Analyst
Scope: ESRI Instructor-Led course (classroom) **Cost**: $1425
Description: This course covers fundamental raster data concepts and shows how to use ArcGIS Spatial Analyst tools to create, process, and analyze spatial data. Students focus on problems that are best solved in a raster environment such as surface analysis and distance measurement.

GIS for Non-GIS Professionals

Title: What is GIS? **Designation**: N-2
Scope: Public **Location**: Portable
Description: This course can be offered with the business-specific course (see N-3). It introduces the student to the core principles of GIS. Includes non-technical definition of GIS, and general examples of the types of business information that can be related to GIS layers, analyses that can be performed, and information and maps that can result using GIS.
Course Length: 30 minutes **Cost**: TBD
Offered: As needed **Refresher Interval**: Once
Status: Development will be completed in 2007.

Title: Using GIS in Your Business
Designation: N-3
Scope: Public
Location: Portable
Description: This course should be offered with N-2 (What is GIS?). It typically should not be offered alone. Presentation is focused on a targeted industry. Offers examples and case studies that showcase specific GIS applications (such as emergency management, public health, transportation, etc.).
Course Length: 30 minutes
Cost: TBD
Offered: As needed
Refresher Interval: Once
Status: Developed as needed for presentation to a specific industry group.

Title: GIS at King County
Designation: N-4
Scope: Public
Location: Portable
Description: This course introduces students to GIS at King County. Includes information on the general structure and function of GIS at the KCGIS Center and King County agencies; types of GIS data available at King County, where to go for more information about GIS in King County (e.g. KCGIS Center website), and how to obtain GIS services.
Course Length: 30 minutes
Cost: TBD
Offered: As Needed
Refresher Interval: Once
Status: Planned for development in 2007.

Curriculum Development Priorities

Training Resources and Priorities
The resources and requirements for custom course development are shown on the "Training Resources and Priorities for In-House Courses" worksheet, which is attached to this document as Appendix B. (Note: the worksheet is updated several times during the year. For the most recent version see http://gisdw/intranet/SoftMigr/documents/TrainingResourcesPriorities.xls on the KCGIS website.)

For each course, an "urgency/difficulty value" was assigned based on informed assumptions about the level of difficulty and time needed to develop the course materials, the availability of course developers, and the perceived urgency of course need. These assumptions were distilled to a simple "urgency-difficulty" matrix which provides a basis to prioritize course development.

Urgency-Difficulty Matrix		Difficulty to develop	
		Easy	Hard
Urgency of need	Critical	CE	CH
	Wait	WE	WH

Custom Courses Recommended for Priority Development
Custom course development is occurring in rounds, with each successive round of courses beginning development as work on the previous round is wrapping up. To date one prototype course (referred to as Round 0), all three Round 1 courses, and two Round 2 courses have been completed and taught. Two Round 2 courses and four Round 3 courses are in development. Later in 2007 the GIS Training Workgroup will recommend to the KCGIS Technical Committee that development begin on some or all of the Round 4 courses as listed below.

The status of course development is as follows:

Round 0:

The Basics of SQL (EA-8): (Critical-Easy; development by Lisa Castle and Debbie Bull.) This course is complete and was first taught in October 2005.

Round 1:

Exploring KCGIS Data Using Metadata (B-2): (Critical-Easy; development by Mike Leathers and Lisa Castle.) This course is complete and was first taught in November 2005.

Keeping Up with ESRI (XT-6): (Critical-Hard; development by Cheryl Wilder.) This course is complete and was first taught in February 2006.

Geoprocessing for Analysts (EA-9): (Critical-Hard; development by Adam Cabrera.) This course is complete and was first taught in February 2006.

Round 2:

Essentials for Editing and Analysis with ArcGIS (EA-1): (Critical-Hard; development by Frank Whitman and David Ostanski.) This course is under development and is scheduled to be completed in March 2007.

Data Posting to the King County Spatial Data Warehouse (EA-3) (Critical-Easy; development by Debbie Bull and Mike Leathers.) This course is complete and was first taught in April 2006.

Exporting Data and Maps to Business Applications (B-3) (Wait-Easy; development by Chris Jansen.) This course is under development with no fixed date for completion.

King County Metadata – Creation, Posting, Maintenance and Best Practices (EA-2) (Critical-Hard; development by Mike Leathers and Debbie Bull.) This course is complete and was first taught in April 2006.

Round 3:

Using ArcView 9.x (B-5): (Critical-Hard); development by Cheryl Wilder.) This two day course will teach the typical ArcView user what they need to know to make practical and efficient use of the software. King County data will be used for demos and exercises and relevant course material will be drawn from several sources. The course will be an extremely cost effective alternative to ESRI certified training.

Managing Table Relationships Without Getting Dumped (EA-7): (Wait-Easy; development by Lisa Castle, Mary Ullrich, and Cheryl Wilder.) This material is being developed as a learning module to be included in the Using ArcView 9.x course. The material can also be taught separately if the need arises. It will provide practical guidance for using tables in ArcGIS analysis and mapping. The student will learn basic theory of table relates, as well as do's and don'ts for creating and managing table relationships.

Best Practices for King County GIS Programmers (C-1): (Wait-Easy; development by the GIS Application Developers Group.) This material will presented as a document describing standards, best practices, procedures, and protocols for GIS programmers to adopt and follow. The materials developed would be geared towards fostering cooperation and creating efficiencies for programmers developing GIS applications for King County.

What is GIS? (N-2): (Wait-Easy; development by Greg Babinski.) This course will provide an introduction to GIS concepts and practices. It is geared toward decision makers with little or no knowledge of GIS. It is the first component of what could be a three part presentation on GIS with the second component focused on a targeted industry, and the third component specific information about how GIS is organized in King County.

Round 4 (Recommendations):

Web-Based Property Research (XT-2): (Wait-Easy; development by Chris Jansen.) This course is currently offered as a free brown bag seminar, but will be updated and formalized to mesh with the current curriculum.

Using iMap (B-1): (Wait-Easy; development by Michael Jenkins.) This course is currently taught as a brown bag seminar. The course needs to be lengthened as one hour is too short to cover all the major functionality of iMap. This course may also be taught as a series of videos. The first pilot video is scheduled to be filmed in April 2007.

The Art and Science of Cartography (XT-7): (Wait-Easy; development by Patrick Jankanish.) This course will provide basic and advanced instruction in cartographic techniques from an award winning map maker. Consideration is being given to expand this course to two days for extended and highly advanced cartographic instruction.

GIS at King County (N-4): (Wait-Easy; development by Greg Babinski.) This course will provide an overview of the governance and organization of King County's GIS. The role of the KCGIS Center will be described, as well as the role of the various agency GIS work units. How to obtain information about KCGIS data and services will also be described.

GIS for ECC Volunteers (XT-5): (Critical-Easy; development by Cheryl Wilder.) The KCGIS Center will coordinate with staff at the RCECC to update and revitalize the GIS training for the ECC volunteers.

Appendix A:
Disposition of 2006 Training Courses per 2007 Training Plan

2006 Course Number and Name	Disposition in 2007 Curriculum Plan
B-1: Using iMap	Exists as brown bag seminar. Work with course developer in 2007 to re-brand, update, and market as half day course.
B-2: Exploring KCGIS Data Using Metadata	Development of course material complete. Now offered as free brown-bag seminar.
B-3: Exporting Data and Maps to Business Applications	Currently in development with no set date for completion.
B-5: Using ArcView 9.x	Currently in development with completion scheduled for second half of 2007. Will include content from B-6 and EA-7.
B-6: Putting King County Data to Work	Move content to B-5 and drop from curriculum.
B-7: Cartographic Standards for KCGIS Users	No longer a course. Content provided in cartographic standards document. Document distributed and discussed in B-3, B-5, EA-1, EA-9, XT-1, XT-5, XT-7, and N-4.
EA-1: Essentials for Editing and Analysis with ArcGIS	Currently finishing development of course material. First course offering scheduled for May 2007.
EA-2: King County GIS Metadata – Creation, Posting, Maintenance, and Best Practices	Development of course material complete.
EA-3: Data Posting to the King County Spatial Data Warehouse	Development of course material complete.
EA-7: Managing Table Relationships Without Getting Dumped	Move content to B-5. Make content modular so that it can be a short stand alone presentation.
EA-8: The Basics of SQL	Development of course material complete.
EA-9: Geoprocessing for Analysts	Development of course material complete.
C-1: Best Practices for King County GIS Programmers	No longer a course. GIS App/Dev Group tasked with completing procedures and protocols document to be distributed to GIS programmers.
C-2: Programming Fundamentals	Drop from curriculum. Falls outside core objective of training GIS users.
C-3: Getting Started with ArcObjects	Drop from curriculum. Too narrow an audience.
XT-1: Getting the Most Out of the KCGIS Knowledge Base and ESRI Online Resources	Renamed “Finding GIS Resources”. No longer a course. Retain as annual topic at KCGIS User Group meeting.
XT-2: Property Research Using Parcel Viewer and iMap	Renamed “Web-Based Property Research”. Exists as brown bag seminar. Work with course developer in 2007 to re-brand, update, and market.

2006 Course Number and Name	Disposition in 2007 Curriculum Plan
XT-3: Understanding and Using King County Assessor's Data	Renamed "Using King County Assessor's Data". Reevaluate the need for this course. Perhaps create users document instead of course.
XT-4: Making Sense of the Census	Renamed "KCGIS Census Resources". Reevaluate the need for this course. Learn more about similar courses marketed by GIS consultants.
XT-5: GIS for Emergency Coordination Center Volunteers	Work with ECC in 2007 to develop proposal for half day training course for volunteers.
XT-6: Keeping Up with ESRI	Development of course material completed, but needs updating for ArcGIS 9.2.
XT-7: The Art and Science of Cartography	Continue discussion regarding expanding the scope of course to two days.
N-1: GIS for Developers	Drop from curriculum. Falls outside core objective of training GIS users.
N-2: What is GIS?	Content development complete, needs branding.
N-3: Using GIS in Your Business	Content templates exist. Specific content created as needed.
N-4: GIS at King County	Shorten course to 30 minutes and add content from N-7.
N-5: Managing SDE for Database Administrators	Drop from curriculum. Falls outside core objective of training GIS users.
N-6: GIS for System Administrators	Drop from curriculum. Falls outside core objective of training GIS users.
N-7: GIS for Decision Makers and Program Managers	Move content to N-4 and drop course from curriculum.